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Colostrum Feeding

Colostrum is an essential part of preventing calf morbidity and mortality. Calves are born with immature immune systems. Colostrum contains a large amount of immunoglobulins, which are absorbed by the neonatal digestive system. Immunoglobulins provide resistance to infectious agents on the farm to which calves will likely be exposed. The immunity that newborn calves receive from colostrum increases their chance of survival.

In 1991-92, the National Animal Health Monitoring System's (NAHMS) National Dairy Heifer Evaluation Project (NDHEP) asked 1,811 dairy farmers in 28 States about their colostrum management practices. NDHEP was followed by NAHMS Dairy '96 and Dairy 2002, both of which also included questions about colostrum feeding and management.

Management

Separating calves from their dams decreases their risk of swallowing the dams' feces or bedding contaminated by the dams' feces and therefore decreases the chance of transmission of diseases such as Johne's.

The 1992 NDHEP reported that 28.0 percent of **producers** separated calves from their dams at birth, before nursing. This percentage increased to 47.9 percent in Dairy '96 and to 52.9 percent in Dairy 2002. Figure 1 shows the **percentage of calves** separated from their mothers, by length of time following birth. Overall, Dairy 2002 indicated that 94.6 percent of calves were separated in 24 hours or less.

Feeding colostrum to calves by hand assures the dairy farmer of the quantity of colostrum being fed. Figure 2 shows the percent of calves by the amount of colostrum fed by hand during the first 24 hours of life, in 1992, 1996, and 2002.

The NDHEP also indicated that 31.6 percent of calves received their first feeding from their mothers. Since NDHEP, other studies have shown that feeding from the dam can increase the chance of infection and often does not provide an adequate amount of antibodies to build sufficient immunity. In addition, the amount of colostrum that calves receive cannot be determined accurately using this feeding method. The NDHEP researchers attributed over half the calf death loss they observed to insufficient colostrum absorption. Dairy '96 reported a decrease in the percentage of calves that received their first feeding of colostrum from nursing (29.4 percent of calves). In Dairy 2002, the percentage of calves that received their first feeding of colostrum from their mothers dropped to 23.1 percent of calves.

Figure 3 shows that about two-thirds of dairy heifer calves were fed their first dose of colostrum from a bucket or bottle in each of the three studies. Use of an esophageal feeder increased over each of the study periods.

Figure 1. Percent of Dairy Heifer Calves Separated from Mothers, by Length of Time Following Birth.

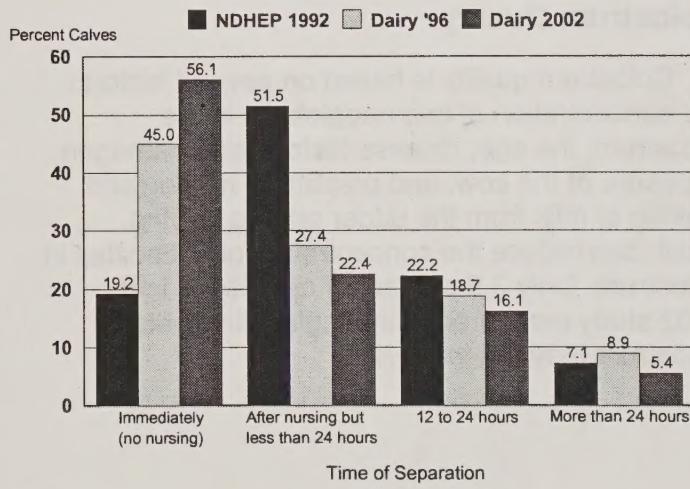
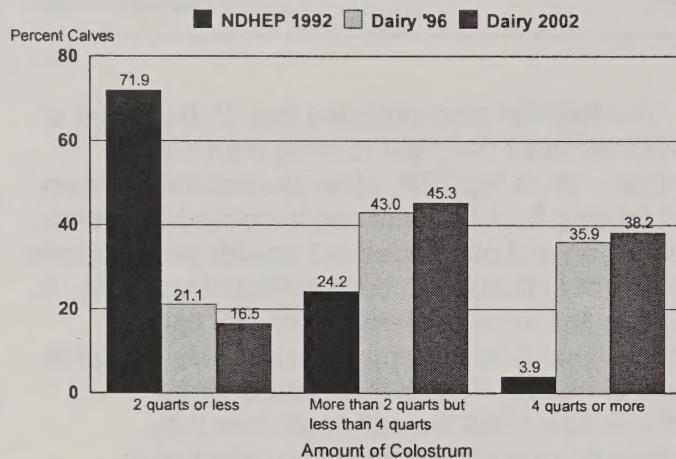


Figure 2. For Operations that Hand-fed Colostrum, Percent of Dairy Heifer Calves by Amount of Colostrum Normally Fed by Hand in the First 24 hours.

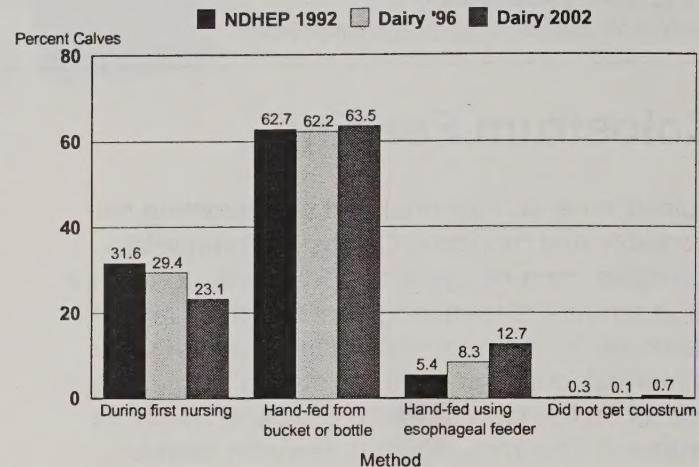


Dairy '96 showed a tremendous increase in the amount of colostrum given to calves in the first 24 hours, compared to the 1992 NDHEP study where 71.9 percent of calves received 2 quarts or less; 24.2 percent received 2 to 4 quarts; and only 3.9 percent were fed more than 4 quarts. In Dairy 2002, the reported amounts of colostrum fed were similar to those reported in Dairy '96. About 1 out of five operations (21.4 percent) fed calves 2 quarts or less of colostrum in both Dairy '96 and Dairy 2002. For both studies, about 1 out of 2 operations fed calves 2 to 4 quarts of colostrum, while 1 out of 5 fed 4 quarts or more.

Colostrum Quality

Colostrum quality is based on several factors: the concentration of immunoglobulin in the colostrum; the age, disease history, and pathogen exposure of the cow; and prepartum milking and leaking of milk from the udder prior to calving, which can reduce the concentration of antibodies in colostrum. Only 3.9 percent of operations in the 2002 study measured immunoglobulin levels in colostrum they fed to calves.

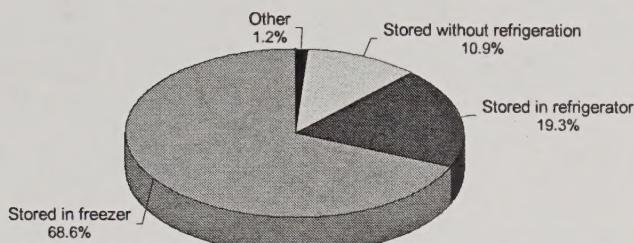
Figure 3. Percent of Dairy Heifer Calves, by Method of First Colostrum Feeding.



Colostrum from an infected cow (for example a cow with Johne's disease) should not be fed to newborn calves. This is especially important if the infected colostrum is pooled, because of the risk of infecting many calves. Although pooling colostrum from more than one cow is not recommended, 27.0 percent of the operations in Dairy 2002 that reported hand-feeding colostrum pooled their colostrum.

The method of colostrum storage also affects colostrum quality. Forty-percent of operations participating in Dairy 2002 stored excess colostrum. The Bovine Alliance on Management & Nutrition's guide on colostrum recommends either refrigerating colostrum at 40 degrees Fahrenheit in 2-quart containers or pre-chilled nipple bottles for less than 24 hours, or freezing it in double plastic freezer bags for storage longer than 24 hours. A freezer was the primary method of colostrum storage (68.6 percent of operations), followed by refrigeration (19.3 percent of operations); no refrigeration (10.9 percent of operations); and other methods (1.2 percent of operations) (Figure 4).

Figure 4. For operations that Stored Colostrum, Percent of Operations by Primary Method of Colostrum Storage.



Pasteurization reduces bacteria concentrations, but it also destroys most of the antibodies in colostrum, rendering the colostrum ineffective in providing immunity to calves. For this reason, pasteurization is not recommended (BAMN, 2001). However, pasteurization at lower temperatures and longer durations may decrease the presence of pathogens while preserving immunoglobulin effectiveness. Less than 1 percent of operations participating in Dairy 2002 pasteurized colostrum.

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